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ABSTRACT

Aggressive and antisocial behavior have persisted as significant social problems. In response, a voluminous amount of research has been generated in an attempt to discover the causes of such behavior. Previous studies have examined separately the role of perinatal biology in the etiology of violent criminal behavior and the etiology of Anti-Social Personality Disorder (ASP). This study brought together those two studies in order to test the hypothesis that violent behavior and ASP may result from different etiological factors. The two studies used Danish birth cohorts to examine both perinatal health and violent, aggressive, and antisocial behavior later in life. In the first study data were gathered from 256 male subjects in a Danish perinatal study. This study indicated that birth complications were strongly related to violent criminal offending, especially to recidivistic offending. The second study sought to determine if there was a relationship between ASP and perinatal difficulties. Danish male subjects (N=94) were part of a study focusing on the comparative behavior of high- and low-risk boys. The results of the study suggested that ASP was unrelated to birth complications. The contrasting findings (positive findings of a relationship between perinatal factors and violent criminal behavior versus negative findings when the diagnosis of ASP is used) implies that ASP and violent criminal behavior may have different etiologies. Findings such as these studies suggest may result in a re-examination of the purpose and utility of a diagnosis such as Anti-Social Personality Disorder. (ABL)

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Biology, Violence, and Antisocial Personality

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Running Head: ANTISOCIAL PERSONALITY

Abstract

Previous reports have separately examined the role of perinatal biology in the etiology of violent criminal behavior and the etiology of Anti-Social Personality Disorder (ASP). This article brings together those two studies in order to test the hypothesis that violent behavior and ASP may result from different etiological factors. The two studies are on Danish birth cohorts, examined both for perinatal health and for violent, aggressive, and antisocial behavior later in life. Results suggest that while perinatal factors may be important in the etiology of violent criminal behavior, they do not appear to be similarly influential in the formation of Anti-Social Personality Disorder. These two studies are examined and their results and findings discussed in light of the limited literature in this area.

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Biology, Violence, and Antisocial Personality

Aggressive and antisocial behaviors have persisted as significant social problems. In response, a voluminous amount of research has been generated in an attempt to discover the causes of such behavior. Despite substantial progress, one significant difficulty is reflected in the different definitions of aggression, violence, and antisocial behavior which are typically utilized.

Definitions have tended to either follow psychiatric-disease models, or to focus on behavioral measures. Among the latter, criminologists have primarily utilized self-reported measures of aggression or official records of violent criminal behavior. Among the former, researchers have primarily utilized the definition of Anti-Social Personality (ASP) as put forward by the Diagnostic and Statistical Manual III-R [1].

Some have questioned the utility and accuracy of regarding aggressive behavior as a personality disorder. The origin of this personality disorder may be found in the 19th century writings of the psychiatrist Pinel, who sought to distinguish chronically aggressive or antisocial people from those with more conventional psychiatric disorders. Thus, the original purpose of this diagnosis was to detect and define those individuals with a marked propensity towards aggressive behavior.

Robert Hare [2] has demonstrated that among individuals who are diagnosable as Anti-Social Personalities, only some are what he terms "primary" psychopaths. This raises the possibility that

current diagnostic criteria is inaccurate in its detection of chronically-aggressive individuals. One way of examining this possibility is by determining how well predictors of aggressive and antisocial behavior predict the diagnosis of Anti-Social Personality Disorder.

This paper will review two sets of results from prospective research conducted by Sarnoff Mednick and his colleagues in Denmark and the United States. Mednick and Kandel [3] demonstrated a positive relationship between prenatal health and violent criminal arrests. That paper examined perinatal variables (pregnancy and birth complications). A recent paper [4] re-affirmed, in a different sample, a relationship between perinatal variables and criminal violent behavior. Finally, Kandel [5] examined the relationship between ASP and genetic and perinatal variables. The purpose of the current paper is to present a comparison of the results from these two separate studies [4-5], which makes it possible to critically compare the contribution of perinatal health to both violent criminal behavior and ASP. This, in turn, may contribute to our knowledge about the utility and validity of the ASP diagnosis.

One of the important theoretical explanations of anti-social behavior emphasizes impaired central nervous system functioning [6-7]. Apart from related research on neuropsychological functioning [6-11], prospective research has both suggested the stability of aggressiveness [12-13] and implied a relationship between minor fetal central nervous system maldevelopment and

childhood behaviors which have been associated with delinquency [14-16]. Further, minor fetal central nervous system maldevelopment has been associated with recidivistic violent offending [17]. This literature suggests that perinatal variables may be related to violent behavior --- whether it is defined as criminal violence or as ASP.

Perinatal Variables and Violence

Kandel and Mednick [4] examined the relationship between perinatal variables and violent criminal behavior (as measured by a criminal arrest). That study will be only briefly reviewed here (see [4], for more details). A number of previous studies have findings suggesting the possibility of a relationship between pregnancy and birth complications and violent behavior [18-23]. It has been hypothesized that pregnancy and birth complications result in fetal brain damage, which predisposes a child to impulsive and aggressive behavior [18, 21].

To examine the hypothesis that perinatal health is related to violent offending, subjects were drawn from a Danish perinatal study examining all 9,125 children born between September 1, 1959, and December 31, 1961, at Rigshospitalet in Copenhagen [24-25]. Because of limited funds, 265 members of this cohort were selected to participate in a prospective study of children at high risk for delinquency. All adolescent and adult data gathered are available only for this sample, which consists of four groups. The first two comparison groups are composed of

children at high risk for deviant behavior (children with schizophrenic mothers or fathers (N=72) and children with character disordered mothers or psychopathic fathers (N=72)); the third group consists of controls, children of parents without a psychiatric history (N=72).

The three groups (total N=216) were matched for (a) social class; (b) sex of child; (c) race; (d) multiple birth status (e.g., twins); (e) pregnancy number; (f) sex of ill parent; (g) mother's age; (h) mother's height; and (i) father's age.

A fourth group (N=49) were special controls for the children of schizophrenic parents; they were matched, individual for individual, for events in the pregnancy and delivery. This matching process renders the comparison of perinatal factors between these controls and the other three groups confounded; thus, this fourth group was not utilized for this study.

Pregnancy and birth complications for each subject were recorded by the senior attending obstetrician at the time of birth. The Perinatal Complications Scale [25] was developed by a panel of American and Danish physicians and assigns weights to complications ranging from 0 (no complication present) to 5 (extremely severe complication). A variety of different types of complications were recorded, resulting in each subject being assigned a Pregnancy Complications Scale score and a Delivery Complications Scale score. In calculating the scores for individual subjects, the weights assigned to all items relevant to a given composite score were summed, yielding a cumulative

weighted score for that area.

The National Police Register arrest record for the 216 subjects was ascertained in 1981, when they were between 20 and 22 years old. All criminal data assessed for this study thus reflects only registered criminality. Violent offenses included: domestic violence, disorderly conduct, illegal possession of a weapon, threats of violence, robbery, armed robbery, assault, attempted murder, and murder. Subjects classified as "violent" criminals may have been arrested for both property and violent crimes.

Of the 216 subjects studied, 15 were registered for a violent offense (6.9% of the sample). The number of violent crimes committed ranged from one to 15 (the one subject who had committed 15 violent crimes was reduced to 5 violent crimes--one more than the next most recidivistic offender--for purposes of analyses). Seven of the 15 violent offenders were recidivistic offenders. Of the remaining 201 subjects, 24 (11.1% of the sample) had been arrested for a property offense (but no violent offense). The term "nonoffenders" in this study refers to the 177 subjects who had no arrest record. Thus final comparison groups consisted of (a) 15 violent criminals; (b) 24 property criminals; and (c) 177 noncriminal subjects.

The theoretically and statistically significant findings are summarized below. Nonoffenders, property offenders, and violent offenders were compared on their level of delivery complications ("high" versus "low"). Delivery complications were split at the

median score (5) into these "high" and "low" groups.

Fully 80% of the violent offenders scored in the "high" range of delivery complications, compared to only 30% of property offenders and 47% of nonoffenders. Notably, the distributional difference between nonoffenders and property offenders is not statistically significant (chi square (1) = 2.9, p=n.s.), but the difference between nonoffenders and violent offenders is (chi square (1) = 6.33, $p<.05$). In addition, 100% (7 out of 7) of the violent recidivists (those with two or more violent offenses) scored "high" on the delivery complications scale, versus only 62.6% (5 out of 8) of the violent one-time offenders and only 18.2% (2 out of 11) of the recidivistic property offenders.

A logistic regression analysis, controlling for the probable confounds of SES and parental psychiatric diagnosis, found that delivery complications significantly accounted for 1.5% of the variance in violent offending ($F(1, 215) = 4.39$, $p<.04$). Considering the 20 years of "noise" between perinatal variables and violent behavior, this is probably not a particularly low percentage.

The literature cited above has focused on antisocial behavior, rather than on any personality variables. Criminological literature, in general, has not examined the possibility of etiological similarities or differences between antisocial behavior and Antisocial Personality. Antisocial Personality (ASP) is a clinical diagnosis which describes individuals who meet certain psychiatric criteria [1].

Specifically, three types of information are needed: (a) information about behavior before the age of 15, including delinquency, truancy, running away from home overnight, aggression, and other maladaptive behaviors; (b) information on adult behaviors, including parenting and family behavior, work behavior, aggressiveness, criminality, and regard for the truth; and (c) evidence of persistent antisocial behavior during adulthood, which cannot be due to Schizophrenia or Severe Mental Retardation.

Perinatal Variables and Anti-Social Personality

Kandel [5] sought to determine any relationship between ASP and perinatal difficulties. Again, this research will only be reviewed briefly here for purposes of comparison; for more detail, please see the original article. Specifically, the paper hypothesized that criminal subjects with ASP will evidence significantly higher rates of pregnancy and birth complications than criminal subjects who do not evidence ASP or noncriminal subjects.

The sample began as a prospective study, focusing on the 1,944 consecutive live male births, from January 1, 1936 to September 30, 1938, which occurred at Rigshospitalet in Copenhagen, Denmark. The focus of the study was on the comparative behavior of high- and low-risk boys; high-risk boys were those who had severely criminal fathers. Thus, both high and low-risk boys who had evidenced criminal behavior or lack of

it were examined for background variables.

The most severely criminal fathers of the cohort were the 6.6% (N=92) who had been given at least one prison sentence. The risk of criminal behavior was 5.6 times greater for the sons of these criminal fathers than for the sons of noncriminal fathers (those fathers with no registration for any offense) [26]. Thus, these sons of criminal fathers were deemed to be at "high risk."

Subject selection procedures defined the four following groups: (1) high risk (i.e., criminal father), criminal boy; (2) high risk, noncriminal boy; (3) low risk, criminal boy; and (4) low risk, noncriminal boy. To be considered "criminal," the boys had to have merited at least one jail sentence plus an additional offense. Subjects with only minor offenses were not included; fathers and sons were either completely free from any registration for criminal behavior or were severely sanctioned.

In random order, within each group, potential subjects were contacted by a letter indicating our interest in the current status of individuals born from 1936 to 1938 at Rigshospitalet. This letter was followed by a home visit and an interview by a psychiatrist who was blind to the subject's status. The interviewer then scheduled the subject's visit to the laboratory for testing. We planned to examine approximately 25 subjects in each of the four groups. Very few subjects who were contacted refused to participate; those who are not accounted for in the following description of each sample were not contacted before grant funds were exhausted.

Group 1. (High risk, criminal boys) There were 92 cohort members who had severely sanctioned fathers. Of these 92 cohort members, 36 (39.1%) were seriously criminal. We began contacting these 36 subjects in random order. Before grant funds were exhausted, we had invited the first 27 of these men to participate in the study, and only one refused. Group 1 thus contained 26 subjects.

Group 2. (High risk, noncriminal sons) Of the 92 fathers with a jail sentence, 56 (60.9%) had sons with no criminal registration. We commenced contacting these 56 subjects in random order. We contacted the first 30 subjects before grants funds were exhausted; three subjects refused to participate, and three were very ill and were not contacted further. Group 2 thus contained 24 subjects.

Group 3. (Low risk, criminal son) Of the 513 subjects with noncriminal fathers, 36 (7%) were seriously criminal. We commenced contacting these 36 men in random order. Before grant funds had exhausted, we had contacted the first 24 of these men. Two subjects refused to participate, and two were consistently not at home; Group 3 thus contained 20 subjects.

Group 4. (Low risk, noncriminal son) Of the 513 men with noncriminal fathers, 477 were not registered for any offense. Of these 477, 35 subjects were selected randomly to be contacted for

inclusion in Group 4. Of the first 30 men contacted before grant funds were exhausted, one subject refused to participate, one was found to be an institutionalized mentally retarded individual, and four were consistently not at home. Group 4 thus contained 24 subjects.

Of the 47 criminals in the sample, 12 (25.5%) met the DSM-III-R criteria for a diagnosis of Antisocial Personality.

Perinatal Health

As with the previous study described [4], pregnancy and birth complications for each subject were recorded by the attending obstetrician at the time of birth. Again, the coding followed the Mednick Perinatal Complications Scale [18, 25], and resulted in the use of a Weighted Score for all analyses (see above). Because the purpose of the current paper is a comparison with the findings of Kandel & Mednick [4], the only report here will be on the Birth Complications data; see Kandel [5] for full analyses of all perinatal data.

ASP criminals were compared to non-ASP criminals and to non-ASP non-criminals in the number of delivery complications. Among the 48 non-ASP non-criminals, 16 (33.3%) had high Birth complications, while 32 (66.7%) had low Birth Complications. Among the 34 non-ASP criminals, 13 (38.2%) had high Birth Complications, while 21 (61.8%) had low Birth Complications Scores. Finally, among the 12 ASP criminals, 7 (58.33%) had high

Birth Complications and 5 (41.7%) had low Birth Complications Scores. The differences between these three distributions were not significant (chi square (2) = 2.54, p=n.s.).

A Multivariate Analysis of Covariance (MANCOVA) was performed next, comparing ASP subjects to non-ASP subjects on their mean Father's criminality, Pregnancy Complications, Birth Complications, and Total Perinatal Complications scores. Socioeconomic status was covaried out since SES might explain any results observed. ASP subjects did not differ from non-ASP subjects on their mean Total Perinatal Complications ($F(1, 93) = 1.51$, p=n.s.); mean Pregnancy Complications ($F(1, 93) = 0.46$, p=n.s.); or mean Birth Complications scores ($F(1, 93) = 2.01$, $p<.15$).

Discussion

One study suggests that birth complications are strongly related to violent criminal offending--especially to recidivistic offending [4]. The second study suggests, conversely, that ASP (the diagnosis intended to detect chronic violent behavior) is unrelated to birth complications.

All subjects in these studies were members of cohorts born at a large Copenhagen obstetric clinic. The subsamples chosen for extensive study were chosen randomly, making it unlikely that they represent a biased selection of cohort members (disregarding the necessary bias of the selection criteria). Participation refusals were too low to have affected the outcome in any

significant way.

Studies relating psychiatric disorders to obstetrical complications first uncovered positive results decades ago [27-28]. Similarly, as reviewed above, obstetrical complications have been implicated in the etiology of aggression. Kandel and Mednick [4] also found a positive relationship between obstetrical variables and criminal violence, especially recidivistic violence.

In contrast to these studies on antisocial behavior, Kandel [5] found no relationship between perinatal factors and the psychiatric diagnosis of Antisocial Personality. Neither perinatal factors taken as one variable nor pregnancy and birth variables considered separately predicted to the development of Antisocial Personality.

While published research exploring congenital factors and Antisocial Personality is rare, two retrospective studies offer similar findings. Szatmari, Reitsma-Street, and Offord [29] found that 58 antisocial adolescents were no more likely to have a high number of pregnancy and birth complications than were their non-antisocial siblings, and Offord [30] found that obstetric complications were of no value in predicting sociopathy in adult patients.

The contrasting findings (positive findings of a relationship between perinatal factors and violent criminal behavior versus negative findings when the diagnosis of ASP is used) implies that Antisocial Personality and violent criminal

behavior may have different etiologies. In examining the causes of Antisocial Personality Disorder, some research has emphasized commonly-cited psychosocial variables, such as lack of father-contact and large numbers of siblings [31], but a more recent review [32] suggests that little knowledge has been produced that effectively accounts for the etiology of this disorder. MacMillan and Kofoed [33] point out that while the clinical characteristics of Antisocial Personality are well defined, this disorder is poorly explained in etiological terms. Some research has, however, implicated neuropsychological impairment and ASP. Malloy, Longabaugh, and Beattie [34] reported three studies of ASP in alcoholic subjects and found that the presence of ASP was a powerful predictor of neuropsychological impairment in alcoholic males. However, while studies of antisocial behavior have implicated congenital factors as a source of neuropsychological impairment in criminals, Malloy and his colleagues found that the main factors contributing to neuropsychological impairment in ASP males were heavy drinking, abuse of other drugs in addition to alcohol, and head injury. These findings suggest that adult neurological damage may be a more evident etiological factor than perinatal factors in the development of Antisocial Personality Disorder.

This study further suggests that ASP may not fulfill the purpose for which it was originally intended. If, in fact, ASP and perinatal factors were related, this would strengthen ASP's relationship to criminally aggressive behavior. Negative

findings, however, tend to weaken that relationship. Thus, findings such as these two studies suggest may result in a re-examination of the purposes and utility of a diagnosis such as Anti-Social Personality Disorder.

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